In re Patent Application of:
KENNETH JOHN DAVEY
Serial No. **09/848,648**
Filing Date: **May 3, 2001**
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In the Claims:

Please enter the following amended claim set:

1. (Currently amended) A system for use in the continuous monitoring of the structural integrity of a structure, said system including at least:

an elastomeric sensor pad having a first structure engaging surface and an opposite surface, said first structure engaging surface provided with a set of at least one first channels which, when said first structure engaging surface is sealingly engaged with said structure, form a corresponding set of at least one first cavities;

a first fluid communication ~~means~~ arrangement for providing fluid communication between said set of at least one first channels and a constant vacuum source; and

an isolation ~~means~~ mechanism for isolating each of said first cavities from fluid communication with said constant vacuum source.

2. (Currently amended) A system according to claim 1 further including ~~means~~ a monitoring device for monitoring for a variation in the vacuum condition between the constant vacuum source and said first cavities.

3. (Currently amended) A system according to claim 1 wherein said sensor pad further includes:

a set of at least one second channels formed on said first structure engaging surface which, when said first surface is sealingly engaged with said structure, form a corresponding set of at least one second cavities;

said second channels intersperse with said first channels; and,

a second fluid communication ~~means~~ arrangement for providing fluid communication between said second cavities and an atmosphere or environment at a pressure different to said constant vacuum source.

4. (Currently amended) A system according to claim 1 wherein said first communication ~~means~~ arrangement includes a third channel provided in said first surface, said third channel being in fluid communication with each of said first channels and with said constant vacuum source.

5. (Currently amended) A system according to claim 1 wherein said first fluid communication ~~means~~ arrangement includes a plurality of conduits, one of each providing fluid communication between respective first channels and the constant vacuum source.

6. (Currently amended) A system according to claim ~~3~~ 4 wherein said second communication ~~means~~arrangement includes a fourth channel provided in the first

surface, said fourth channel being in fluid communication with each of said second channels and said atmosphere or environment.

7. (Currently amended) A system according to claim 3 wherein said second fluid communication ~~means~~ arrangement comprises an opening in each of said second channels that provides fluid communication through the pad to said atmosphere environment.

8. (Currently amended) A system according to claim 3 wherein said sensor pad is transparent or at least translucent.

9. (Currently amended) A system according to claim 7 further including a supply of a dye indicating liquid in fluid communication with said second channels to provide a visual indication of the location of a flaw.

10. (Currently amended) A system according to claim 3 wherein said isolation ~~means~~ mechanism includes ~~means~~ a mechanism for applying force to said pad at respective locations above each or selected ones of said first and/or second channels, to seal said first and/or second channels against the structure and fluidly isolate said first and/or second cavities from said vacuum source.

11. (Currently amended) A system according to claim 1 wherein said ~~isolating means~~ isolation mechanism is adapted to individually and/or sequentially isolate said cavities so that progressively all of said cavities are isolated from said vacuum source.

12. (Currently amended) A system according to claim 1 wherein said ~~isolating means~~ isolation mechanism is programmable so that the sequence of isolating said cavities can be varied.

13. (Currently amended) A system according to claim 10 wherein said ~~means~~ mechanism for applying force includes a plurality of actuators supported on or in said pad above each of said channels for applying force to sealingly deform said channels against the structure.

14. (Currently amended) A system according to claim 1 wherein said first communication ~~means~~ arrangement includes a duct formed on a second surface of said pad opposite said first surface and respective holes formed in said pad providing fluid communication between said first channels and said duct, and said isolation ~~means~~ mechanism includes ~~means~~ a mechanism for applying a fluid isolation force at respective

locations to obstruct said duct, to fluidly isolate selected ones of said first channels from said vacuum source.

15. (Currently amended) A system according to claim 14 wherein said ~~means~~ mechanism for applying a fluid isolation force includes a pair of minuscule pinch rollers disposed on opposite sides of said duct for sealing a length of said duct from said vacuum source to progressively isolate said first channels in communication with said length from said vacuum source.

16. (Currently amended) A system according to claim 14 wherein said ~~means~~ mechanism for applying a fluid isolation force includes a moveable seal disposed in said duct for sealing a length of said duct from said vacuum source and ~~means~~ a system for moving said seal along said duct to progressively fluidly isolate said first channels in communication with said length of said duct from said vacuum source.

17. (Currently amended) A method for continuously monitoring the integrity of a structure, said method including at least the steps of:

providing a sensor pad having a first structure engaging surface and opposite surface, the first surface provided with a set of at least one first channels;

sealingly engaging said first surface of the sensor pad with the structure so that said channels together with the structure form a corresponding set of first cavities;

coupling said first cavities to a constant vacuum source;

monitoring for a change in vacuum condition between said cavities and said constant vacuum source; and

~~isolating~~ isolating each of said first cavities from said constant vacuum source.

18. (Currently amended) A method according to claim 17 wherein the step of isolating each of said first cavities includes venting said first cavities to the atmosphere or surrounding environment.

19. (Original) A method for continuously monitoring the integrity of a structure, said method including at least the steps of:

providing a sensor pad having a first structure engaging surface and an opposite surface, the first surface provided with a set of at least first channels and a set of at least one second channels, said first channels isolated from and interspersed with said second channels;

sealingly engaging said first surface of the sensor pad to the structure so that said channels together with the structure form a corresponding set of first and second cavities;

coupling said first cavities to a constant vacuum source;

coupling said second cavities to an atmosphere or environment at a different pressure or vacuum condition to said constant vacuum source;

monitoring for a change the vacuum condition between said first cavities and said vacuum source; and

isolating each of said first cavities from said constant vacuum source.

20. (Currently amended) A method according to claim 19 wherein said step of isolating said cavities includes individually and sequentially isolating said cavities so that progressively all of said cavities are isolated from said vacuum source.

21. (Currently amended) A method according to claim 19 further including forming said pad of a transparent or translucent material.

22. (Original) A method according to claim 21 further including the step of placing a supply of a dye indicating liquid in fluid communication with said second channels to provide a visual indication of the location of a flaw.

23. (New) A system for use in the continuous monitoring of the structural integrity of a structure, said system including at least:

an elastomeric sensor pad having a first structure engaging surface and an opposite surface, said first structure engaging surface provided with a set of at least one first channels and a set of at least one second channels interspersed with said first channels which, when said first structure engaging surface is sealingly engaged with said structure, form respective corresponding sets of at least one first cavities and at least one second cavities;

a first fluid communication arrangement for providing fluid communication between said set of at least one first channels and a constant vacuum source;

a second fluid communication arrangement for providing fluid communication between said second cavities and an atmosphere or environment at a pressure different to said constant vacuum source; and,

an isolation mechanism for isolating each or selected ones of said first and/or second channels, to seal said first and/or second channels against the structure and fluidly isolate said first and/or second cavities from said vacuum source.

24. (New) A system for use in the continuous monitoring of the structural integrity of a structure, said system including at least:

an elastomeric sensor pad having a first structure engaging surface and an opposite surface, said first structure engaging surface provided with a set of at least one first channels which, when said first structure engaging surface is sealingly engaged with said structure, form a corresponding set of at least one first cavities;

a first fluid communication arrangement for providing fluid communication between said set of at least one first channels and a constant vacuum source; and

an isolation mechanism for individually and/or sequentially isolating said cavities so that progressively all of said cavities are isolated from said vacuum source.

25. (New) A system for use in the continuous monitoring of the structural integrity of a structure, said system including at least:

an elastomeric sensor pad having a first structure engaging surface and an opposite surface, said first structure engaging surface provided with a set of at least one first channels which, when said first structure engaging surface is sealingly engaged with said structure, form a corresponding set of at least one first cavities;

a first fluid communication arrangement for providing fluid communication between said set of at least one first channels and a constant vacuum source;

an isolation mechanism for isolating each of said first cavities from fluid communication with said constant vacuum source;

wherein said first communication arrangement includes a duct formed on a second surface of said pad opposite said first surface and respective holes formed in said pad providing fluid communication between said first channels and said duct, and said isolation mechanism includes a mechanism for applying a fluid isolation force at respective locations to obstruct said duct, to fluidly isolate selected ones of said first channels from said vacuum source.

26. (New) A system according to claim 25 wherein said mechanism for applying a fluid isolation force includes a pair of minuscule pinch rollers disposed on opposite sides of said duct for sealing a length of said duct from said vacuum source to progressively isolate said first channels in communication with said length from said vacuum source.

27. (New) A system according to claim 25 wherein said mechanism for applying a fluid isolation force includes a moveable seal disposed in said duct for sealing a length of said duct from said vacuum source and a system for moving said seal along said duct to progressively fluidly isolate said first channels in communication with said length of said duct from said vacuum source.

28. (New) A method for continuously monitoring the integrity of a structure, said method including at least the steps of:

providing a sensor pad having a first structure engaging surface and an opposite surface, the first surface provided with a set of at least first channels and a set of at least one second channels, said first channels isolated from and interspersed with said second channels;

sealingly engaging said first surface of the sensor pad to the structure so that said channels together with the structure form a corresponding set of first and second cavities;

coupling said first cavities to a constant vacuum source;

coupling said second cavities to an atmosphere or environment at a different pressure or vacuum condition to said constant vacuum source;

monitoring for a change the vacuum condition between said first cavities and said vacuum source; and

isolating each of said first cavities individually and sequentially from said constant vacuum source so that progressively all of said cavities are isolated from said vacuum source.

29. (New) A method according to claim 28 further including forming said pad of a transparent or translucent material.

30. (New) A method according to claim 29 further including the step of placing a supply of a dye indicating liquid in fluid communication with said second channels to provide a visual indication of the location of a flaw.